

FACT SHEET FOR STATE WASTE DISCHARGE PERMIT ST-5379

City of Warden – Industrial Wastewater Treatment Facility

SUMMARY

The city of Warden (Grant Co.) owns and operates an industrial wastewater treatment facility that is separate from its sanitary system. The facility receives process wastewater from two year around potato processors and one milk bottler. The water passes through a series of facultative lagoons and is finally discharged to land via one of several center pivot irrigation systems comprising approximately 400 acres. The system is designed for a flow of 1.6 mgd.

The proposed permit will continue the influent and effluent testing requirements in the current permit. Some additional soils testing will be required because there are no ground water monitoring wells to insure that the facilities are not impacting ground water. The Permittee will also be required to submit several amended reports (hydrogeologic and engineering) that were not done during the current permit. Several operations & maintenance related issues will also need to be resolved including the repair of all flow meters, the repair of earthen lagoon walls due to erosion, and the full online operation of the surface aerators in the aeration cell.

The operation and maintenance responsibilities of the facility may change during the next permit cycle. Negotiations are ongoing for a service agreement between the city and a private entity that would transfer O&M to the private entity. Depending on the contents of the agreement, which Ecology must review and approve, the permit may need to be modified to show the city and private entity as co-permittees.

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INTRODUCTION

This fact sheet is a companion document to the draft State Waste Discharge Permit No. **ST-5379**. The Department of Ecology (the Department) is proposing to issue this permit, which will allow discharge of wastewater to waters of the State of Washington. This fact sheet explains the nature of the proposed discharge, the Department's decisions on limiting the pollutants in the wastewater, and the regulatory and technical bases for those decisions.

Washington State law (RCW 90.48.080 and 90.48.162) requires that a permit be issued before discharge of wastewater to waters of the state is allowed. Regulations adopted by the state include procedures for issuing permits (Chapter 173-216 WAC), and water quality criteria for ground waters (Chapter 173-200 WAC). They also establish requirements which are to be included in the permit.

This fact sheet and draft permit are available for review by interested persons as described in Appendix A--Public Involvement Information.

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in these reviews have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Changes to the permit will be addressed in Appendix C--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Warden
Facility Name and Address	Industrial Wastewater Treatment Facility 201 S. Ash Street Warden, WA 98857
Type of Facility	Treatment of combined process waste flows from two potato processors and a milk packaging facility.
Type of Treatment:	Facultative lagoons with land application
Discharge Location	Latitude: 48° 58' 40" N Longitude: 119° 03' 10" W.
Legal Description of Application Area	Approx 400 acres in: SE ¼ Sec. 9, E ½ Sec. 17, and NE ¼ Sec. 20, T. 17N, R. 30 EWM Latitude: 48° 58' 40" N. Longitude: 119° 03' 10" W.
Contact at Facility	Name: Mike Thompson, City Administrator Telephone #: 509.349.2033

<u>GENERAL INFORMATION</u>	
Responsible Official	Name: Roldan Capitillo, Mayor Telephone #: 509.349.2033 FAX #: 349.2027

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

The City of Warden (Grant Co.; Fig. 1) owns and operates an industrial wastewater treatment facility that treats the combined process waste stream flow from two potato processors (Washington Potato and Ochoa Foods) and a milk packaging facility (Country Morning Farms). The industrial treatment facility was constructed in 1953 and is separate from the city's sanitary system. Country Morning Farms (CMF) is a recent addition to the treatment system (2005) while the potato processors have been at the site from the beginning.

Most of the treatment facility is located within the city limits of Warden (Fig. 2). The topography of the site is gently rolling. Irrigated production agriculture is the predominant land use in the area. The average annual precipitation is less than 10 inches. A predominant feature of the location is the presence of the East Low Canal which flows east to west. This man-made unlined canal is a primary irrigation water supply source that is part of the federal Columbia Basin Irrigation Project which supplies irrigation water to approximately 500,000 acres in the central basin of Washington. Water is present in the irrigation water distribution system from March through October.

The treatment facility is generally comprised of 17 unlined, earthen-bermed facultative lagoons with final treatment via spray irrigation onto approximately 400 acres (Fig. 2). The lagoons also provide storage during the winter non-growing season. An upgrade was completed in 2000 that included the following changes:

1. Conversion of Cell #2 to an aerated lagoon to promote mineralization and biomass production.
2. Construction of a series of earthen lined solids removal cells downstream of the aerated lagoon.
3. Construction of a polishing cell downstream of the solids removal cells.
4. Construction of a lined mixing pond near the newly added 200 acres located south of the city.

A second phase of the upgrade was to have been completed, which was the construction of a new winter storage pond to provide 72 million gallons of additional storage. Proposed increases in production by the dischargers required this new pond. This phase has not been done.

INDUSTRIAL DISCHARGERS

Ochoa Foods

This facility was formerly known as Basin Frozen Foods. Approximately 70,000 tons of hash browns and french fries are produced year around. The wastewater is pretreated (screening and clarifier) prior to its discharge to the city's industrial wastewater collection system as per state

waste discharge permit ST-5386. The permit limits the discharge to a maximum daily flow of 965,000 gpd and an average monthly flow of 757,700 gpd.

Washington Potato (WP)

This facility operates year around and processes approximately 142,000 tons of raw potatoes into approximately 40,000 tons of dehydrated potato products. Following screening and a clarifier, the water is sent to the city's industrial collection system as per state waste discharge permit ST-5382. The permit limits flow to a maximum daily flow of 965,000 gpd and an average monthly flow of 652,350 gpd.

The Ochoa and WP flows are combined and the mixture is transported via gravity flow across the E. Low Canal and into the aeration lagoon.

Country Morning Farms (CMF)

Approximately 36 million pounds of raw milk is trucked to the facility where it is pasteurized and put into containers year around. Future plans call for expanding to bottling juices and water. Batch discharges are metered into the city's system as per state permit ST-8095. The maximum daily and average monthly discharge limits are 17,000 and 10,000 gpd, respectively.

TREATMENT PROCESSES

The discharge flows from Ochoa and WP make up 98-99% of the inflow to the industrial system. Flows from these two dischargers are combined in a single pipeline that spans the East Low Canal attached to a railroad bridge (Fig. 3). The main line terminates at the Cell #2 where the wastewater is aerated using surface aerators; Fig. 4. The wastewater is then directed to one of two series of earthen-lined solids removal cells. Each series of cells is alternately operated to allow the cells in one series to dewater and dry for solids removal. Water from the solids removal cells discharge into the polishing pond. This pond is designed to be operated at a shallow depth to promote evaporation and nitrogen loss via ammonia volatilization and denitrification. Flow from the polishing pond can be directed to any one of the other lagoons.

The wastewater from CMF is transported to the treatment facility via an underground pipe that extends along the southern periphery of the adjacent 125 acre sprayfield and then under the East Low Canal where it day-lights near the southern end of cell #3. This water is not sent to the head-works of the treatment process; i.e., aeration lagoon. Instead, it is allowed to mix with the water from the polishing pond which can be directed to any of the remaining lagoons for spray irrigation.

Wastewater that is sent to Cells 9-12 can not be pumped out. Water is lost through seepage or evaporation.

The engineering report for the 2000 upgrades (City of Warden, 1999) estimated that the lagoon treatment process would result in an annual effluent nitrogen load of approximately 248,000 lbs.

SPRAYFIELD SYSTEM

Except for a small amount of handlines (8 acres), all wastewater is applied via center pivot systems; Fig. 2. Cell 5A and 8 act as pump-storage ponds to supply the wastewater to the

sprayfields; Fig. 4. Supplemental freshwater can be diverted from the East Low Canal into Cell 8 where the mixture is pumped to the 125 and 30 acre fields. Wastewater that is pumped from 5A is sent to mix pond where fresh water can be added from a nearby city-owned supply well before being irrigated onto the southern 200 acre sites.

GROUND WATER

The geology and hydrogeology of the site have been described in a series of reports (King, 1997; 1998a;1998b;1999). The soils are generally described as fine sandy/silt loams. A common subsurface feature is the presence of layers of cemented soils (caliche) at varying depths.

Most wells in the vicinity of the site are completed in the basalt; there are very few that are completed above the basalt. The scarcity of wells completed above the basalt made it difficult to evaluate the geology and hydrogeology of the unconfined soils at the site. However, based on available well log data, hand installed piezometers, and four exploratory wells, the following has been concluded about the lagoon and 125 acre sprayfield site:

1. The basalt tends to dip towards the East Low Canal in a west and northwest direction.
2. Ground water does not flow into the site from the direction of the city because of a near surface basalt ridge. An upgradient well can not be sited.
3. Any ground water beneath the site is from the lagoon and canal seepage. An estimated 40,000 gpd is lost via seepage from the lagoons (Gray & Osborne, 2004).
4. Ground water flows upward in the western part of the site and enters into the drain ditch.

Based on the available information, it was recommended that monitoring be done by sampling the drain ditch along the western edge of the site, and not by using monitoring wells.

DRAIN DITCH

The drain ditch along the western edge of the lagoon site flows northward; Fig. 2 and 3. It is here where the ground water beneath the site discharges to according to information presented in the HG reports. An earthen dam was constructed across the ditch as part of the 2000 upgrade (Fig. 2 and 3) to capture the water and pump it to the lagoons for mixing with the wastewater for irrigation. A flow control structure at the dam allows for the control of the pooled water level or complete flow-through the dam.

OPERATION AND MAINTENANCE

There is current activity that will change the entire operation and maintenance, and ownership of the industrial treatment facility. Ochoa Foods is taking the lead on designing a new treatment facility which would be comprised of the existing city lagoons, a new six mile pipeline, a new lined winter storage pond, and a new land treatment site comprised of 3500 acres. All three dischargers would continue to discharge to the system. The pipeline would extend eastward from Warden and into Adams Co. to the sprayfields which are privately owned and are currently used for production agriculture. A draft engineering report for the new additions has been completed and SEPA is being addressed with Adams Co. as the lead agency.

This action is being taken to move the irrigation and required additional winter storage, which was not built in phase 2, away from the proximity of the city to reduce odor problems. In addition, the city informed all of the dischargers in June 2004 that it does not want to continue to operate the facility and that the dischargers must find an alternate wastewater system.

Negotiations are ongoing between the city and Ochoa Foods to reach a service agreement which will allow “OB-3 Resource Management, LLC” to assume all O&M of the facility, with the intention of future ownership by OB-3. The three dischargers will continue to pay the city for use of the system, and the city will pay OB-3 to operate and maintain the facility under the terms of the service agreement. The city’s continued participation is needed because of payments needed to pay off municipal bonds which were used to fund the 2000 upgrades.

It is anticipated that construction of the pipeline and new lined storage impoundment at the sprayfields site will be installed in 2006. Material shortages from hurricane Katrina in 2005 put a damper on construction activities.

Until the completion of the service agreement between the city and OB-3, the current permit will be reissued to the city. Prior to assuming O&M of the facility the agreement must be reviewed and approved by Ecology as required by state law; RCW 70.150.040(9). This approval is to ensure consistency with the purposes of chapters 90.46 and 90.48 RCW. Depending on the language of the approved service agreement, the permit may need to be modified to show OB-3 as a co-permittee.

After OB-3 has completed SEPA and Ecology has approved the engineering report for the new treatment facility, the permit will also need to be modified to allow the discharge to the 3500 acre site in Adams Co.

Winter Applications

Phase 2 of the 2000 upgrade included the construction of additional winter storage. Based on estimated increases in production and discharge flows from the processors, the engineering report concluded that additional winter storage was needed. This additional storage was not built.

The city and dischargers informed Ecology in January 2004 that there was insufficient lagoon volume available to store all of the process water for the 2004-05 winter. It was requested that allowances be made to apply some wastewater (100 million gallons) during the winter. Ecology allowed the applications with the understanding that the new pipeline and sprayfields would be brought on-line in 2005.

Because the construction of the upgrade did not occur in 2005, the city requested some additional limited amount of wastewater application (50 million gallons) during the 2005-06 winter. Ecology agreed to this on the condition that the city and Ochoa continue to finalize the service agreement, and that Ochoa continues to make progress on implementing their proposed facility upgrade that will include additional storage.

PERMIT STATUS

The previous permit for this facility was issued on December 18, 2000.

An application for permit renewal was submitted to the Department on June 29, 2005 and accepted by the Department on November 16, 2005.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

During the history of the previous permit, the Permittee has not been in compliance based on Discharge Monitoring Reports (DMRs) and other reports submitted to the Department and inspections conducted by the Department.

The current permit requires the annual submittal of Irrigation and Crop Management Plans. Only one plan report was submitted for the 2001 irrigation year. An O&M manual for the 2000 upgrade was required, but was not submitted. In addition, supplemental hydrogeologic information was required to verify the closed basin model of the site; none was submitted.

The permittee did submit a required treatment process monitoring plan to gather information within the lagoon system. This plan was meant to collect samples within the lagoon system to verify the levels of treatment that were used in the design of the upgrades. The sampling plan was never implemented.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the permit application and in discharge monitoring reports. The proposed wastewater discharge prior to land application is characterized for the following parameters as presented in the permit application which were based on 2004 discharge data:

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Concentration</u>
BOD	Average = 756 mg/L
TDS	Average = 825 mg/L
Ammonia (as N)	Average = 67 mg/L
pH	4.1 – 8.1 s.u.
TKN (as N)	Average = 110 mg/L

A review of the influent wastewater monitoring data submitted in DMRs for the period July 2001 – September 2005 (Addendum) shows that the BOD concentration ranged from approximately 400 to 3600 mg/L with an average of approximately 2100 mg/L. Based on Ecology's experience with other potato processors, the average BOD value given in the permit application is low, and the value for 2001-05 period is more representative. Except for a value in October 2004, the influent BOD loads to the facility have been less than the design value; 32,000 lbs/day.

Maximum daily influent flow values have generally been within the design capacity of the system; 1.5 mgd. The average inflow was about 0.85 mgd for the 2001-05 period.

The influent nitrogen concentration was approximately 150 mg/L and is consistent with what has been observed for other potato process wastewater in the region. Except for a few occasions, the influent nitrogen load has been within design parameters.

PROPOSED PERMIT LIMITATIONS

State regulations require that limitations set forth in a waste discharge permit must be either technology- or water quality-based. Wastewater must be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the State. The minimum requirements to demonstrate compliance with the AKART standard were determined in the engineering reports (Irrigation and Hydraulics Unlimited; 1998, 1999; City of Warden, 1999), in conformance with *Guidelines for the Preparation of Engineering Reports for Industrial Wastewater Land Application Systems*, May 1993.

The permit also includes limitations on the quantity and quality of the wastewater applied to the sprayfield that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Quality Standards (Chapter 173-200 WAC).

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

All waste discharge permits issued by the Department must specify conditions requiring available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). The following permit limitations are necessary to satisfy the requirement for AKART:

1. Wastewater shall be land applied via spray irrigation not to exceed agronomic rates (as defined in the Department's ground water implementation guidance) for total nitrogen and water, and at rates for other wastewater constituents that are protective of background ground water quality.
2. Total nitrogen and water shall be applied to the sprayfields as determined by a current irrigation and crop plan.
3. The system must be operated so as to protect the existing and future beneficial uses of the ground water and not cause a violation of the ground water standards.

GROUND WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's ground waters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violations of the Ground Water Quality Standards. The goal of the ground water quality standards is to maintain the highest quality of the State's ground waters and to protect existing and future beneficial uses of the ground water through the reduction or elimination of the discharge of contaminants to ground water [WAC 173-200-010(4)]. This goal is achieved by [GW Implementation Guidance, Abstract, page x]:

1. Requiring that AKART (all known available and reasonable methods of prevention, control and treatment) be applied to any discharge;
2. Application of the antidegradation policy of the ground water quality standards. This policy mandates protecting background water quality and preventing degradation of water quality which would harm a beneficial use or violate the ground water standards; and
3. Establishing numeric and narrative criteria for the protection of human health and welfare in the ground water quality standards.

Applicable ground water criteria as defined in Chapter 173-200 WAC and in RCW 90.48.520 for this discharge include the following:

Table 2: Ground Water Quality Criteria

Total Dissolved Solids	500 mg/L
Nitrate	10 mg/L
pH	6.5 to 8.5 standard units

Currently, there are no ground water monitoring wells on the site. The decision not to install any wells was based on the results of the HG report and the permittee's consultant recommendation that potential impacts from the lagoons and sprayfields be monitored at the drain ditch. Any ground water beneath the site would surface at the drain according to closed basin ground water model proposed by the HG report. No supplemental ground water information was submitted by the permittee, as required by the current permit, that could have changed this design and added monitoring wells.

The results of the drain ditch monitoring are presented in the Addendum. The concentrations of the different nitrogen fractions are generally low with nitrates being less than the ground water criteria; 10 mg/L. However, the TDS concentration in the ditch exceeds the ground water criteria value; 500 mg/L.

The cation/anion concentrations for the ditch are given in meq/L. This was done to assist in the generation of a Stiff diagram. These diagrams provide a visual representation of the ion concentration of water. Cations are plotted on the left of a zero vertical axis and anion concentrations are plotted on the right. Connecting the concentrations produces a shape that can be used to visually compare water quality. The Stiff diagram for the ditch, lagoon 5, and the East Low Canal is presented in the Addendum.

The diagram appears to show that the water quality in the drain ditch is more similar to the lagoon 5 wastewater than the irrigation water in the East Low Canal. The close proximity of the unlined lagoons to the ditch (Fig. 3) and that the lagoons are filled year around most likely contribute to the makeup of the ditch water.

To supplement the water quality data collected from the ditch, lagoon, and canal, the permittee submitted water level elevation information. Readings were taken from the canal, lagoon 5, and one site with nested piezometers (three; Fig. 3). The water level data and the chemical data were to have been used and reported by the permittee in an HG report addendum to verify the closed

ground water basin model for the site. The HG addendum was not done. Ecology reviewed the water level elevation data and determined:

- Water levels in the lagoons are more closely related to plant output than they are to either East Low Canal depths or ground water flow;
- Water level data from Lagoon 5 has little or no recognizable correlation to levels recorded in the piezometers;
- The rise and fall of water levels in the nested piezometers appears to have a direct correlation to the rise and fall of water levels within the East Low Canal;
- Potentiometric data alone will not establish a link between East Low Canal water and the ground water under the site;
- Water samples should be collected from the nested piezometers and the East Low Canal and the drain ditch and analyzed for the major cations and anions as per the current sampling schedule.

COMPARISON OF LIMITATIONS WITH THE EXISTING PERMIT ISSUED DECEMBER 18, 2000

Table 3: Comparison of Previous and New Limits

Parameter	Existing Limits	Proposed Limits
Total annual hydraulic load	None	398 MG
Avg. inflow for max month	1.6 MGD	1.6 MGD
BOD load for max month	35,000 lbs/day	35,000 lbs/day
TN load for max month	2200 lbs/day	2200 lbs/day
Total annual nitrogen load	510,000 lbs	510,000 lbs
Total Suspended Solids	None	6600 lbs/day

These limitations will be presented in Section S4 of the proposed permit; FACILITY LOADING.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that effluent limitations are being achieved (WAC 173-216-110).

INFLUENT WASTEWATER MONITORING

The following changes will be made in the influent wastewater monitoring requirements that are in the current permit: an increase in the testing frequency of all chemical parameters from

1/month to 2/month; adding the reporting of TSS in “lbs/day”; adding the reporting of the “total annual nitrogen load”; adding the reporting of the “total annual influent flow”.

Increasing the testing frequency from once to twice/month is believed necessary to give a better understanding of the influent characteristics during any given month, especially since both potato processors operate 24hrs per day. More frequent testing will allow for a better estimate of influent loadings to verify the operations of the system relative to the design values used in the engineering report.

Reporting the total annual N load and influent flow will allow the determination of compliance with the design criteria for these parameters.

IRRIGATION WASTEWATER MONITORING

The testing frequency for the irrigated wastewater will not change from the current requirement of once/month. The current lagoon storage (approximately 53 MG) provides a retention time of approximately 33 days at the design flow; 1.6 mgd. This relatively long retention time results in a somewhat homogeneous and consistent effluent that allows for a once/month sampling frequency.

However, “Soluble BOD” testing will be added to the irrigation monitoring. This addition was made because of recent findings at other land treatment facilities that the soluble BOD fraction of the wastewater can cause the weathering of the soils which can result in the leaching of calcium, magnesium, and other cations into the ground water. The soluble fraction can percolate deeper into the soil column where decomposition can cause weathering of the soils and the release of salts such as calcium and magnesium. These can leach out of the soil column and cause an increase in the dissolved solids content of the ground water.

The absence of ground water monitoring wells and the necessity to apply wastewater during the winter non-growing season makes adding soluble BOD testing necessary to get a better understanding of the wastewater loading to the fields and its potential impacts to the ground water.

There will also be some changes in the reporting of flows to the sprayfields. The Permittee currently reports irrigation flows to the 125, 35, and 200 acre sites. Unfortunately, the values reported for the 200 acre site do not indicate which of the four pivots received the wastewater. The proposed permit will require the Permittee to measure and report field specific flows for each of the pivots that make up the 200 acre site. This will require the Permittee to give each field an identifying name, and then report flow values to each of the pivots.

Sampling and the chemical analysis of wastewater applied to the 200 acre pivots can be done once per month from the mix pond. The monthly values can be applied to each of the pivots.

In addition, flows to the 30 acre sprayfield will also be reported.

SUPPLEMENTAL IRRIGATION WATER MONITORING

Supplemental irrigation water is needed because the annual volume of process wastewater is not sufficient to meet the total water requirements of the crops during the growing season.

Supplemental water is supplied by a city owned well near the mixing pond for the southern 200

acre site and from the East Low Canal for the other fields. The amount of supplemental irrigation water and its nutrient concentration must be accounted for in determining the total water and nutrient load to the sprayfields during the growing season.

The permit will require a one-time nutrient analysis of these waters. The concentration values will be used for the remainder of the permit cycle to estimate the nutrient loading to the fields contributed by the supplemental water. The concentration values will be reported in the annual Irrigation and Crop Management Plan report.

The measurement of the supplemental water flows to each field will be required.

SURFACE WATER MONITORING

The current permit requires some seasonal sampling of the drain ditch, lagoon 5, and the East Low Canal. The purpose is to gather data to help assess the certainty of the closed ground water basin concept as presented in the HG report. As described earlier, the cation/anion data indicates that lagoon 5 may be impacting the drain ditch.

The surface water monitoring in the current permit will be continued to the proposed permit. Flow and ammonia testing at the ditch will be eliminated. All cation and anion results will be reported in mg/L instead of meq/L.

The current permit requires sampling of the E. Low Canal at two locations; above and below the lagoon site. A comparison of the cation and anion values showed the samples to be similar. Therefore, one sample location (at the Road U bridge) will be required for the East Low Canal.

PIEZOMETER MONITORING

The current permit requires periodic measurements of the water level elevations at the nested piezometers that are located near the irrigation pumphouse (Fig. 3). This monitoring will be continued to provide data that can be analyzed by the Permittee in an addendum to the HG report to help verify the closed ground water basin model of the site.

It was discovered when the piezometer and E. Low Canal elevations were graphed that the changes in elevation at both locations matched, indicating that the canal could also be impacting the drain ditch. This is somewhat contradictory to the findings of the hydrogeologic investigation which concluded that ground water flow is upward from the deeper confined aquifer, not lateral from a perched or unconfined aquifer. To gain additional information on the ground water beneath the site and the interactions with the surface waters, some seasonal cation and anion testing of the piezometers will be added to the permit.

This information can be used along with other data collected at the E. Low Canal, drain ditch, and lagoon 5 will add more to the understanding of the site.

WATER LEVEL ELEVATION MONITORING

The current permit requires the periodic measurement (6/year) of the water level elevation at the piezometers, E. Low Canal, lagoon 5 and the drain ditch. These readings will continue, but not at the drain ditch. Readings for the ditch are estimated based on the position of the gate at the flow

control structure at the dam, not at a free flowing section above the dam. Readings at the dam do not represent the true elevation of the ditch water.

CROP MONITORING

Crop monitoring was a requirement in the last permit and will be continued in the proposed new permit. Reporting of the data will be done with the submittal of the annual irrigation and crop management plan. The data will be used to develop a nutrient, water and salt budget for the fields. No crop monitoring data was submitted by the permittee during the past permit cycle.

The list of cations and anions will be replaced with “ash weight” and “bicarbonate” (mg/Kg, dry wt). The ash weight minus the bicarbonate will provide an estimate of the total inorganic salt content of the plant tissue. This information will provide an estimate of the fixed dissolved solids uptake by the crop and allow for the determination of a dissolved solids balance for the sprayfields.

Sample collection will be required for all grain/grass-type of crops (alfalfa; wheat; mint, etc.). These values will be used in the determination of the end-of-year nitrogen/nutrient, and water balance reporting requirements. For non-forage type crops (e.g., corn, potatoes), the use of literature values for nitrogen/nutrient uptake will be acceptable.

SOIL MONITORING

Soil monitoring in the current permit is required twice per year; beginning and end of growing season. Unfortunately, no soil testing was done during the past permit cycle. The absence of a ground water monitoring system makes soil testing extremely important at this site. Nutrient and salt levels in the soils must be carefully monitored to promote a healthy crop to maximize nutrient uptake and minimize the leaching of nutrients and salts beyond the root zone and into the ground water.

Twice per year monitoring will be done and the following testing will be required:

Test depths: 0.5, 1, 1.5, and 2ft:

Exchangeable sodium percentage

CEC

Organic Matter

Total-P

pH

sodium, calcium, magnesium, potassium

Test depths: 1 – 6 ft

TKN, nitrate, conductivity

The soil data will be reported in the annual irrigation and crop management plan. Some of the data will be used to develop trend analysis graphs for the soil profile.

GROUND WATER MONITORING

Ground water monitoring will not be required in the proposed permit for the current sprayfields. This decision is based, in part, on the draft service agreement between OB-3's and the city that will most likely be implemented in 2006. The draft agreement shows that the current sprayfields will not be used after October 1, 2006. A hydrogeologic study of the new sprayfield site may require the installation of ground water monitoring wells.

In addition to not using the sprayfields, the draft agreement describes a phased abandonment of the current unlined facultative pond system. Most all of the ponds will be taken off line by December 31, 2009.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-216-110).

FACILITY LOADING

The design criteria for this treatment facility are taken from the 1998 and 1999 engineering reports prepared by Irrigation and Hydraulics Unlimited and the city and are as follows:

Monthly average flow (max. month):	1.6 MGD
BOD influent loading (max. month):	35,000 lbs/day
Total nitrogen loading (max. month):	2200 lbs/day
Total annual nitrogen load:	510,000 lbs
TSS influent loading (max. month):	6600 lbs/day

The permit requires the Permittee to maintain adequate capacity to treat the flows and waste loading to the treatment plant (WAC 173-216-110[4]). For significant changes in loadings to the treatment works, the permit requires a new application and an engineering report (WAC 173-216-110[5]).

IRRIGATION AND CROP MANAGEMENT PLANS

The annual submittal of the irrigation and crop management plan (ICMP) is required, in part, to determine compliance with the agronomic rate discharge limitation in Section S1, and to insure the proper operations and maintenance of the site to protect the ground water. This plan shall describe and evaluate various irrigation controls to regulate nutrient and salt loads, and any operations necessary to control soil salinity.

The plan will be required to:

1. Summarize the operations of the entire treatment site for the previous year and describe the operations for the upcoming year based on the chosen crop rotation including estimated nitrogen, water, and salt loading, and the leaching requirement to control soil salinity.

2. Compare the actual nitrogen, water, and salt loadings, and leaching fraction for each field with the estimated values presented in the previous year's ICMP.
3. Develop a salt budget for each field and with the results of the soils analysis, determine the need to plan leaching to control soil salinity.
4. Report all crop and soil testing results. The end-of-crop-year soil profile nitrate values for each field will be presented in a graphical form to show at least a three year running trend.

OPERATIONS AND MAINTENANCE

The proposed permit contains condition S.5. as authorized under Chapter 173-240-150 WAC and Chapter 173-216-110 WAC. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

BEST MANAGEMENT PRACTICES

Several BMPs will be added to the permit to maximize nutrient and water uptake, and the reduce the potential for impacts to the ground water. These BMPs were developed based on Ecology's experience with other land treatment systems.

1. A viable and healthy cover crop shall be maintained on all fields that receive wastewater.
2. Every effort shall be made to follow annual crops with deep-rooted alfalfa, wheat, or a perennial crop to maximize the uptake of residual soil nitrate.
3. Adjust irrigation plans during high precipitation events to minimize percolate losses.
4. Use supplemental irrigation water and/or winter precipitation to meet the Leaching Requirement for each field.
5. Operate each field so that the three year running average end-of-crop-year soil profile nitrate concentration is stable or declining.

O&M MANUAL – UPDATE

The current permit required the submittal of an O&M manual to support the facility upgrades that were completed in 2000; no manual was submitted. The proposed permit will extend the requirement for the submittal of an O&M Manual from it original due date of June 1, 2003 to January 1, 2007.

FLOW METERS – REPAIR

A visit to the site in November 2005 revealed that none of the flow meters that were installed during the 2000 upgrade have worked properly. Flow values reported on monthly DMRs were estimated based on water useage by the dischargers and operator experience with the system.

The proposed permit will require that all flow meters that were installed during the 2000 upgrade be either repaired or replaced.

PROCESS MONITORING PLAN

The city submitted a process monitoring plan as required by the current permit (Gray&Osborne, 2004) but the sampling was never implemented. Two six-week sampling periods were planned during the summer of 2004 and winter 2005 where weekly samples would be taken at several locations within the treatment process. A final report was to have been submitted by May 2005.

The permit will require the implementation of the process monitoring plan.

AERATION BASIN – REPAIR

The November 2005 site visit also revealed that the surface aerators in the aeration basin have not been used for some time. The decision was made to not operate the aerators because the wave action caused by the aerators has caused erosion of the inner earthen walls of the basin. Ecology records show that a letter was submitted from the city (dated November 17, 2004) to notify Ecology that armoring of the embankments of the aerator cell would occur in November/December 2004.

Not operating the aerators has caused a significant change in the operations of the treatment system because the aeration lagoon was a major component of the 2000 upgrade. Not operating the aerators has also caused the buildup of a thick surface scum over the entire surface of the basin. This could add odors when temperatures increase in the spring.

The permittee will be required to submit a repair plan to Ecology on what steps will be taken to repair the aeration pond and a timeline for its completion. All repairs shall be completed by January 1, 2007.

ETHYLENE DIBROMIDE TESTING

Samples collected by the city in June 2004 from two of their drinking water wells showed the presence of ethylene dibromide (EDB) at levels higher than the drinking water standard's maximum contaminant level (MCL = 0.05 ug/L). EDB was used, in part, as a soil fumigant until it was banned for this use by EPA in 1984. Short- and long-term effects of EDB include liver, heart, and kidney problems, and cancer. The source of the EDB was never found but there were questions raised about whether the potato wastewater from unlined ponds in the vicinity of the wells could be a source.

In an effort to provide some EDB data for the potato process wastewater being discharged to the unlined ponds in the treatment system, the proposed permit will requires some limited EDB testing for the influent and effluent. Samples will be collected in the Spring and Fall to represent wastewater from raw potatoes that were stored and freshly harvested.

SOLID WASTE PLAN

This proposed permit requires, under authority of RCW 90.48.080, that the Permittee develop and submit to the Department a solid waste plan to prevent solid waste from causing pollution of waters of the state. This plan will describe the method of disposal of the solids that are removed from the solids settling cells.

SPILL PLAN

The city submitted a spill plan in March 2003. This was done in response to concerns expressed by the East Columbia Basin Irrigation District concerning two leaks from the city's wastewater line into the East Low Canal in July and November 2002. The leaks occurred at the site where the main wastewater line transporting wastewater from Ochoa Foods and WP crosses above the canal before discharging into the aeration basin. The line was repaired by enclosing a new 18" PVC line within a 24" steel sleeve. Repairs were completed in December 2002.

The proposed permit requires the Permittee to update the spill plan. The list of notifications must include Ochoa Foods, Country Morning Farms, and Ecology's 24-hr spill line; 509.329.3400.

GROUND WATER QUALITY EVALUATION (HYDROGEOLOGIC STUDY)

The current permit required the permittee to submit an addendum to the hydrogeologic study. The addendum was to have reported the additional ground water information from newly installed exploratory wells along the northern boundary of the site, and an evaluation of piezometer, East Low Canal, and drain ditch chemical and water level information.

It was discovered during the November 2005 site visit that additional ground water wells had been installed along the northern boundary of the site. The city's consultant contracted the installation but the city did not have any information on the wells.

Given that the unlined lagoons will continue to be used until the end of 2009, it has been determined that the HG report addendum is still needed. The permittee shall be required to:

1. Report to Ecology the location and installation information for the additional ground water wells that have been installed in the northern area of the site.
2. Collect chemical and water elevation data in the piezometers and E. Low Canal, and water level information in the new monitoring wells.
3. Submit an addendum to the HG report that will evaluate all ground water, piezometer, and canal data to verify, or not, the closed ground water basin model for the site.

ENGINEERING REPORT – ADDENDUM

Information gathered from implementing the 2004 Process Control Monitoring Plan shall be used to prepare an addendum to the engineering report that will verify or replace the design treatment values used for the 2000 upgrade.

GENERAL CONDITIONS

General Conditions are based directly on state laws and regulations and have been standardized for all industrial waste discharge to ground water permits issued by the Department.

Condition G1 requires responsible officials or their designated representatives to sign submittals to the Department. Condition G2 requires the Permittee to allow the Department to access the treatment system, production facility, and records related to the permit. Condition G3 specifies conditions for modifying, suspending or terminating the permit. Condition G4 requires the Permittee to apply to the Department prior to increasing or varying the discharge from the levels

stated in the permit application. Condition G5 requires the Permittee to construct, modify, and operate the permitted facility in accordance with approved engineering documents. Condition G6 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations. Conditions G7 and G8 relate to permit renewal and transfer. Condition G9 requires the payment of permit fees. Condition G10 describes the penalties for violating permit conditions.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, and to protect human health and the beneficial uses of waters of the State of Washington. The Department proposes that the permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

City of Warden. 1999. Industrial Wastewater Treatment Facility. August.

Irrigation and Hydraulics Unlimited. 1999. Addendum to the October 1998 Engineering Report for the City of Warden, Washington, Industrial Treatment Facility. January.

Irrigation and Hydraulics Unlimited. 1998. Engineering Report for the City of Warden, Washington, Industrial Treatment Facility. October.

King, Larry G., Ph.D. 1997. Hydrogeology near Warden, Washington. October.

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King, Larry G., Ph.D. 1999. Addendum 2 to Hydrogeology Affecting Wastewater Treatment Sites at Warden, Washington. February.

Washington State Department of Ecology, 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.

Washington State Department of Ecology.

Laws and Regulations(<http://www.ecy.wa.gov/laws-rules/index.html>)

Permit and Wastewater Related Information
(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Washington State Department of Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology Publication # 96-02.

Washington State University, November, 1981. Laboratory Procedures - Soil Testing Laboratory. 38 pp.

APPENDICES

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on December 7 and 14, 2005 in the Columbia Basin Herald to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on February 16, 2005 in the Columbia Basin Herald to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (30) day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-216-100). Public notice regarding any hearing will be circulated at least thirty (30) days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing.

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within thirty (30) days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509.329.3524, or by writing to the address listed above.

The Fact Sheet and permit were written by Don Nichols.

APPENDIX B--GLOSSARY

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation--The average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of the collection or treatment facility.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Distribution Uniformity--The uniformity of infiltration (or application in the case of sprinkle or trickle irrigation) throughout the field expressed as a percent relating to the average depth infiltrated in the lowest one-quarter of the area to the average depth of water infiltrated.

Engineering Report--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Soil Scientist--An individual who is registered as a Certified or Registered Professional Soil Scientist or as a Certified Professional Soil Specialist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils or by the National Society of Consulting Scientists or who has the credentials for membership. Minimum requirements for eligibility are: possession of a baccalaureate, masters, or doctorate degree from a U.S. or Canadian institution with a minimum of 30 semester hours or 45 quarter hours professional core courses in agronomy, crops or soils, and have 5,3,or 1 years, respectively, of professional experience working in the area of agronomy, crops, or soils.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Coliform Bacteria--A microbiological test which detects and enumerates the total coliform group of bacteria in water samples.

Total Dissolved Solids--That portion of total solids in water or wastewater that passes through a specific filter.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Water Quality-based Effluent Limit--A limit on the concentration of an effluent parameter that is intended to prevent pollution of the receiving water.

APPENDIX C--RESPONSE TO COMMENTS